Simultaneous Stabilization Of Multimachine Power Systems Viagenetic Algorithms

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Summary

This paper demonstrates the use of genetic algorithms for the simultaneous stabilization of multimachine power systems over a wide range of operating conditions via single-setting power system stabilizers. The power system operating at various conditions is treated as a finite set of plants. The problem of selecting the parameters of power system stabilizers which simultaneously stabilize this set of plants is converted to a simple optimization problem which is solved by a genetic algorithm with an eigenvalue-based objective function. Two objective functions are presented, allowing the selection of the stabilizer parameters to shift some of the closed-loop eigenvalues to the left-hand side of a vertical line in the complex s-plane, or to a wedge-shape sector in the complex s-plane. The effectiveness of the suggested technique in damping local and inter-area modes of oscillations in multimachine power systems is verified through eigenvalue analysis and simulation results